Volume 2016 Article 124

2016

Archaeological Investigations Under Texas Antiquities Permit No. 4925 for the Texas Department of Transportation, Fort Bend, Galveston, and Harris Counties, Texas

Nesta Anderson

Damon Burden

Karla Còrdova

Rebecca Sager

Heath Bentley

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Authors

Nesta Anderson, Damon Burden, Karla Còrdova, Rebecca Sager, Heath Bentley, and James T. Abbott

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CSJ Nos. 1415-02-032, 3050-03-015, 6192-34-001

By Nesta Anderson, Damon Burden, Karla Córdova, Rebecca Sager, Heath Bentley, and James T. Abbott

James T Abbott, Principal Investigator

December 2016

ABSTRACT

In May 2008, PBSJ (now Atkins North America, Inc.), was contracted by the Texas Department of Transportation (TxDOT), to conduct archaeological impact evaluations and surveys for the Houston and Beaumont Districts under Contract 578-XX-SA004. This contract was for on-demand services, with specific work defined by individual work authorizations. However, all investigations were subsumed under a single Texas Antiquities Permit (No. 4925) for the contract, with Michael Nash serving as Principal Investigator during fieldwork. Four work authorizations were issued, but only three surveys were conducted due to a refusal of Right-of-Entry on one job. All fieldwork was conducted between October 2008 and April 2010. Projects were located in Fort Bend, Galveston, and Harris Counties. Following completion of the fieldwork and the majority of reporting, the permit was transferred to TxDOT, with James T. Abbott serving as Principal Investigator. Final preparation of this report was performed by Abbott, based upon a draft provided by Atkins.

WA 1 authorized survey of a planned detention pond adjacent to Farm to Market Road (FM) 2978, between 0.065 and 0.145 south of Bogs Road in Harris County. An intensive survey of the 4.13-acre site was conducted on October 2, 2008 by Rebecca Sager and Ephriam McDowell. Four shovel tests were excavated during the survey, all of which were negative for cultural material. No cultural resources were encountered during the survey, and Atkins recommended that no further investigations were warranted and the project receive archaeological clearance.

WA 2 authorized a survey prior to construction of beach stabilization structures along a 4.7-mile length of SH 87 in Galveston County. The archaeological project area designated in the scope of work consisted of 35 acres of existing right-of-way (ROW) within an overall 70.0 acres of existing ROW. A visual inspection of the project area and excavation of one shovel test was conducted on February 4 and 5, 2009, by Damon Burden and Joe Craig. No cultural resources encountered during the survey, the survey area was found to be heavily disturbed, and Atkins recommended that no further investigations were warranted.

WA 3 was a proposed realignment of Conroe-Hufsmith Road at FM 2978 in Montgomery County. The project would have required 2.0 acres of new ROW, and the APE would have included the new ROW as well as any existing ROW along the project length. However, permission to conduct archaeological investigations was denied by the affected landowner, and the Work Authorization was cancelled.

WA 4 was issued for an intensive survey in advance of improvements to FM 1464 at New Home Cemetery in Fort Bend County. An initial survey was conducted at the location, but due to a contractual dispute between Atkins and TxDOT regarding the scope of services, not all work associated with the project was completed by Atkins. This report describes the work that was completed under this permit.

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INTRODUCTION

In 2008, PBS&J (now Atkins North America [Atkins]) was contracted by Texas Department of Transportation (TxDOT) to conduct archaeological and historic surveys, monitoring, and background reviews for proposed TxDOT projects in its Houston and Beaumont Districts. These investigations were conducted to assist TXDOT in fulfilling their obligations under National Historic Preservation Act (NHPA) and the Texas Antiquities Code of Texas. Because this was an indefinite delivery contract, specific projects tasked for survey under the contract were identified in individual work authorizations. Four work authorizations were issued under the contract, but one of these work authorizations was cancelled because the landowner refused right of entry for survey. Fieldwork for the three remaining projects was conducted in Harris, Galveston and Fort Bend Counties between October 2008 and April 2010. All three surveys were authorized as intensive surveys, but two were downgraded to "pedestrian surveys with subjective shovel testing"—essentially reconnaissance-level surveys—based on field observations. All investigations were conducted under Texas Antiquities Permit No. 4925, with Michael Nash serving as Principal Investigator. Coordination of the results of these surveys was completed on the basis of the individual interim survey reports (Appendix A).

As a result of a fundamental disagreement between PBS&J (Atkins) management and TxDOT management regarding the scope of services specified in the contract, additional work on the contract was not authorized, and final reporting of the surveys was not completed. In October of 2015, the permit was transferred from Atkins (Michael Nash) to TxDOT (James Abbott). Less than a month later, the permit (which had already been extended once) entered default. This summary report of Texas Antiquities Permit No. 4925 investigations was prepared using electronic notes and an incomplete draft supplied by Atkins. It summarizes the three investigations conducted under Texas Antiquities Permit 4925, and is presented to satisfy the reporting requirements under TxDOT's MOU.

WA1 (3050-03-015)

This proposed undertaking involved the construction of a 4.13-acre detention pond adjacent to Farm to Market Road (FM) 2978 between 0.065 and 0.145 miles south of Bogs Road, about 4 miles north of Tomball, in Harris County, Texas (Figure 1). This location is about 600 ft. south of Spring Creek. The construction of the detention pond would require the acquisition of 4.13 acres of new right-of-way (ROW). No new easements or temporary construction detours would be required.

Based upon review of TxDOT plans, the maximum area of potential effect (APE), for the purpose of this cultural resources survey is assumed to be the 4.13 acre tract, extending to a depth of 12 ft (3.66 m). The APE for this project occurred on 100% privately owned property in Harris County, Texas. Fieldwork was conducted on October 2, 2008.

Figure 1: Project locaction map. Note that WA3 was not performed, and is not illustrated.

WA2 (6192-34-001)

This proposed project consisted of improvements to a 4.7-mile-long (7.7-kilometer-long) segment of SH 87 from its intersection with Four-Mile Road to its intersection with SH 124 (south of the Town of High Island) on Bolivar Peninsula in eastern Galveston County, Texas (see Figure 1). The project would construct a series of beach erosion stabilization structures within the previously specified project length to prevent further degradation of the existing

highway right of way (ROW) and damage to the highway roadbed. The stabilization structures would consist of sets of parallel and stacked concrete Jersey barriers. The base of these structures would be composed of two concrete Jersey barriers set immediately parallel to each other; the intervening space would be filled with tamped coarse-grained sand/shell backfill held in place with filter fabric. A third Jersey barrier would be placed on top of the two concrete structures and intervening sand/shell backfill, thus completing the barrier. The structure would have an approximate maximum height of 5.5 feet (1.7 meters) and a basal width that would range from 4.0 to 6.5 feet (1.2 to 2.0 meters). These structures would be footed in area clays that underlie overriding sands and sandy soils. The tops of the barriers would be located at least 1.0 foot (0.30 meter) higher than the surface of adjacent highway crown segments.

Stabilization structures would only be installed on the gulf side (south side) of SH 87, in those areas where previous wave-derived erosion has created low-lying, typically flooded areas within the existing highway ROW. Said barriers would span the width of the various low-lying areas and extend a minimum of 15.0 feet (4.6 meters) to each side of the average water line in each of the areas where barriers would be required. Thus, barrier installation would require trench excavation in elevated areas adjacent to the erosion cuts, and backfilling between the barriers and areas of intact sediment to the north of the barriers in low-lying, degraded areas (see typical plan view and sections in attached section).
The area of potential effects (APE) for the proposed project includes the existing 120-foot-wide (36.6-meter-wide) highway ROW within the previously specified project limits. Proposed barrier installation would be confined to the existing highway ROW south of the paved surface of SH 87. The outside (south) edges of the proposed stabilization structures would typically be offset 5.0 feet (1.5 meters) from the south edge of the existing highway ROW. Some utilities adjustments might be required at the west end of the proposed project area. However, existing utilities are typically located on the north side of the existing highway ROW, so utilities adjustments typically were not anticipated.

The horizontal extent of the APE for this project thus comprises existing State Highway ROW within the project limits. The proposed project would have a total length of 4.7 miles (7.7 kilometers), but stabilization barriers would not be installed along the entire project length. The total project APE would include approximately 70.0 acres of previously disturbed highway ROW, of which about 23.0 acres of ROW is located south of the existing highway pavement. For the purposes of this project, the archeological project area would include half of the existing highway ROW width (60 feet [18.3 meters]) throughout the 4.7-mile-long (7.7-kilometer-long) project length. This area would encompass approximately 35.0 acres of existing highway ROW. Impacts derived from barrier installation would not extend more than 4.5 feet (1.4 meters) below surface levels along the edges of adjacent segments of highway pavement (see typical sections in attached section). Utilities adjustments (should they be

required) would not extend more than 6.0 feet (1.8 meters) below surface levels along the edges of adjacent segments of highway pavement.

Work for this proposed project consisted of a 15+ acre pedestrian survey that was conducted from February 4 to February 9, 2009. The proposed APE was composed entirely of State-owned SH 87 ROW.

WA3

This proposed project involved improvements to Farm-to-Market Road (FM) 2978 at Conroe-Hufsmith Road in Montgomery County, TX. The proposed improvements would realign Conroe-Hufsmith Road at FM 2978 approximately 200-feet north of its existing intersection. TXDOT would acquire 2.0 acres for the proposed project. The area of potential effect (APE) was defined as the proposed and existing right-of-way (ROW), the distance covered by the project, and the depth of construction disturbance. Right of access for archaeological investigations was denied by the only landowner that would be affected by the proposed project. Accordingly, the work authorization was cancelled, and cultural resource compliance work was deferred to later in the project development cycle.

WA4 (1415-02-032)

This proposed undertaking involves road widening and improvements to FM 1464 within and surrounding New Home Cemetery in Fort Bend County (see Figure 1). The property is owned by Fort Bend County, and the project was developed in partnership with the County government. The proposed road-widening project is located on both sides of FM 1464, and the overall project extends between SH99 (Grand Parkway) and FM 1093. This alignment, which at that time avoided the New Home Cemetery property, was previously surveyed in 2005 by PBS&J under Texas Antiquities Permit 3009. That survey encountered no properties, and PBS&J recommended no additional work. TxDOT concurred, and coordinated that recommendation with the Texas SHPO in June 2005.

However, against the advice of TxDOT, Fort Bend County determined in 2009 that additional ROW, including 20 ft of property adjacent to the existing ROW in New Home Cemetery, was necessary for the project. They acquired approximately 0.154 acre from New Home Cemetery and 2.340 acres from private landowners on the opposite side of FM 1464. Accordingly, TxDOT contracted with PBS&J for a supplementary survey between Stratford Creek Drive and Oyster Creek, focusing on the expanded APE in and adjacent to New Home cemetery. This current survey spanned existing and proposed FM 1464 ROW by approximately 20 feet (ft) eastward into New Home Cemetery (336 ft in length) and by 31.6 ft on the opposite (west) side of FM 1464 (3,225 ft in length) between Stratford Creek Drive and Oyster Creek (Figure 1). The area of potential effect (APE) was defined as the project

footprint in the defined portion of the overall project, including existing and proposed ROW. For the purpose of this cultural resources survey, it was assumed to be 2.494 acres (108,630 square feet) of land to a depth of 3 ft. Initial pedestrian survey was conducted on April 14-15, and April 21, 2010.

ENVIRONMENTAL SETTING

The environmental setting of each survey area is described below.

WA1 (CSJ: 3050-03-015)

This survey area is situated in the Mixed Pine-Hardwood subregion of the Piney Woods natural region, as defined by the Texas Parks & Wildlife Department (TPWD). The entire APE is situated on a relatively flat upland terrace above Spring Creek with loamy ancient coastal terrace soils. with low probability of prehistoric artifact deposits (Abbott 2001; Figure 2). The area has a 0-3% slope that shows no indication of drainage cuts. The tract is largely forested and dominated by evergreen trees and scrub plants. Grasses are present, but only in areas not shaded by trees. The ground under the thickly wooded areas is covered by leaves and pine needles (Figure 3; Figure 4).

The underlying geologic unit is the Lissie Formation, of lower to middle Pleistocene age (Bureau of Economic Geology 1968). Soils of the APE are mapped as Hockley fine sandy loam (Alfisols). The area is well drained with moderately rapid permeability (Soil Survey Staff 2008).

At the time of survey, the APE and most of the surrounding vicinity was an undeveloped wooded area. The notable exception was directly across FM 2978, where a strip mall had been recently constructed. Grasses in the open areas were between 1 inch and 7 inches in height. However, most of the area is dominated by evergreen trees, including southern pine and live oak, with scrub and thorny vines (greenbriar) in the understory. Treed areas had little to no grass, but much of the ground was covered with a thick layer of decomposing pineneedles and leaf litter. Overall ground surface visibility was very poor, and was estimated at 0-20%.

WA2 (CSJ: 6192-34-001)

The proposed APE is located in a nearly level barrier island/peninsula setting (Bolivar Peninsula represents the same type of process that formed the barrier chain [i.e., Galveston, Mustang, and Padre Islands], but is connected to the mainland on the eastern end) along the shore of the Gulf of Mexico. The entire area is mapped as high potential ("Survey recommended, deep prospection recommended if deep impacts are anticipated") from a geological perspective by the Houston-PALM (Abbott 2001; Figure 3) due to its setting (barrier islands along the Texas coast are recognized to have formed during roughly the last six millennia, well within the time that humans were present). The shoreline in this area is actively receding, and the survey tract includes discrete areas of pedestaled sediment and relatively shallow surface depressions created by wave overwash and backwash, surface water runoff, and eolian processes. State Highway 87 parallels the existing NE to SW-oriented shoreline and is aligned west-southwest

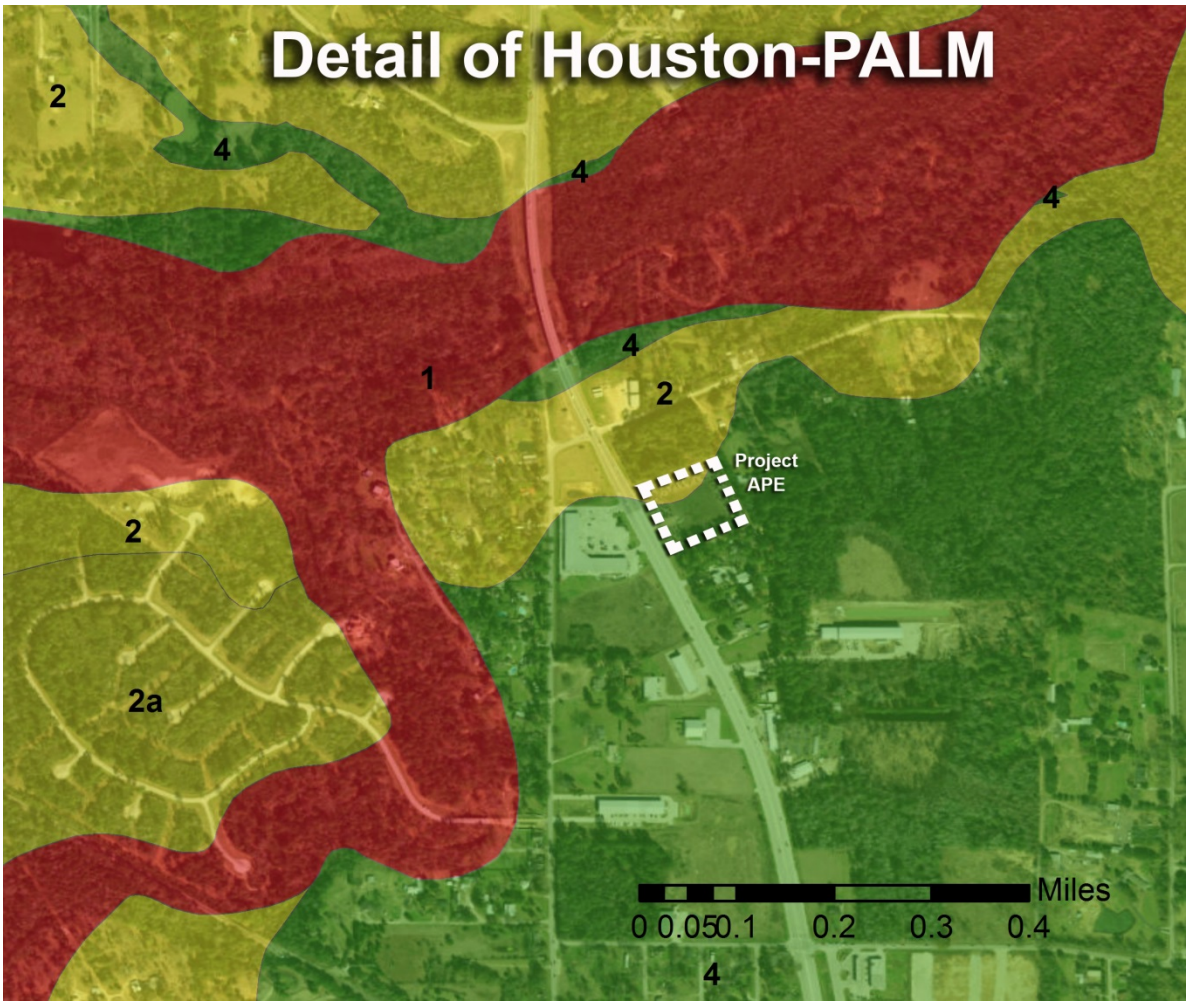

Figure 2: Detail of Houston PALM map showing detention pond (WA1) APE. Key to map units: 1 = Surface survey recommended, deep reconnaissance recommended if deep impacts are anticipated; 2 = Surface survey recommended, no deep reconnaissance recommended; 2a = Surface survey of mounds only; no deep reconnaissance recommended; 3 = No surface survey recommended, deep reconnaissance recommended if deep impacts are anticipated; 3a = No surface survey recommended, deep reconnaissance recommended only if severe deep impacts are anticipated; 4 = no survey recommended.

to east-northeast within the project limits. The shoreline is located south of existing highway ROW, but the receding shoreline is encroaching on the highway. Surface elevations within the proposed project area range from approximately 2 feet to 7 feet above National Geodetic Vertical Datum (NGVD) of 1929 (USGS 1994 High Island, Tex. [2994-422], 7.5' topographic quadrangle). The field investigation indicated that the basal elevations of some of the eroded and flooded areas within the proposed APE may be at or slightly below the mean sea level.

The proposed APE is mapped as Holocene-age Barrier-island deposits [Qbi] (Fisher 1982 – see attached section). This geological unit is characterized by "sand, silt, and clay; mostly sand, well-sorted, fine-grained, abundant shells and shell fragments; interfingers with clay and silt in landward directions; includes beach ridge, spit, tidal channel, tidal-delta, and

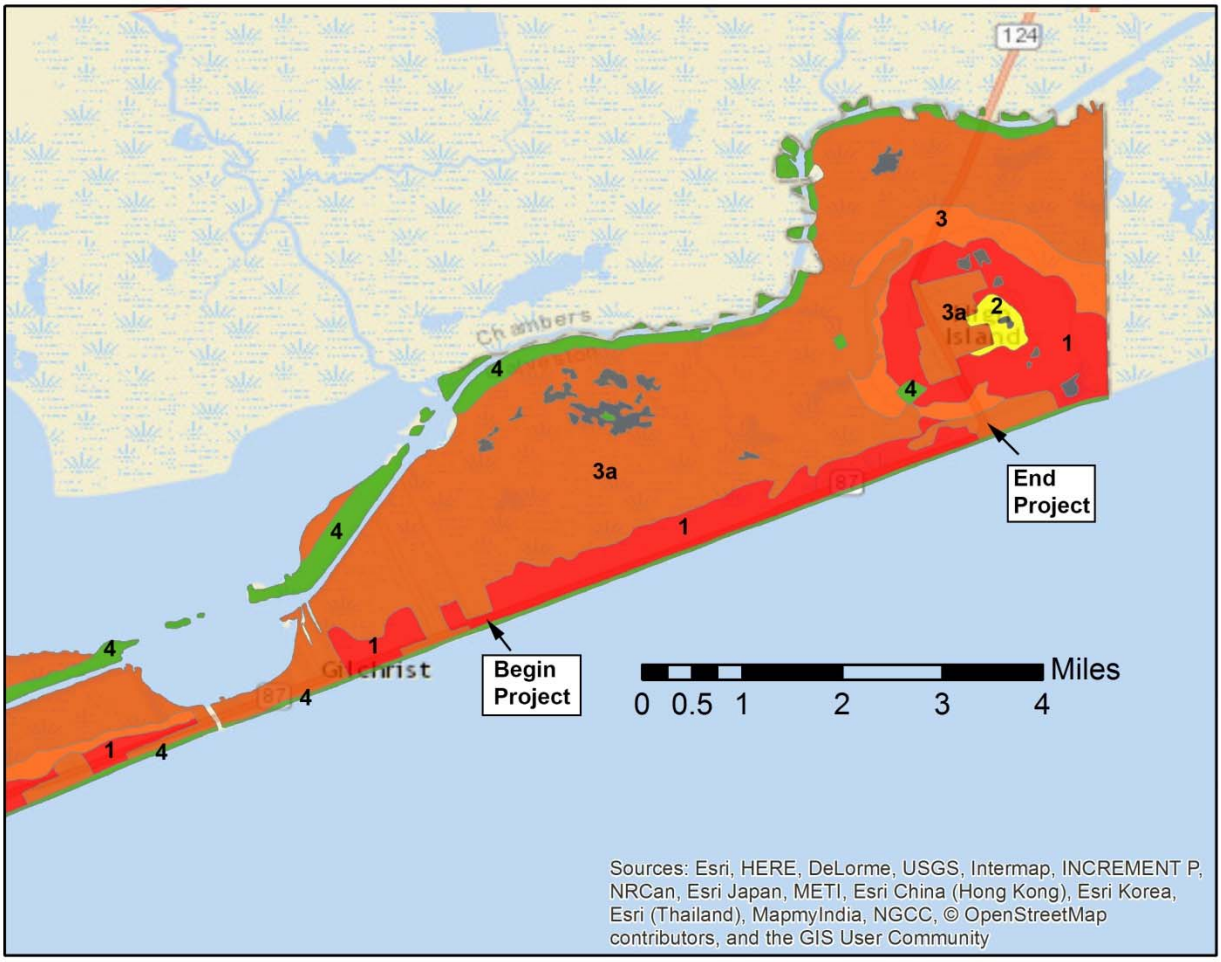

Figure 3: Detail of Houston PALM map showing US 87 project (WA2) APE. Key to map units: 1 = Surface survey recommended, deep reconnaissance recommended if deep impacts are anticipated; 2 = Surface survey recommended, no deep reconnaissance recommended; 2a = Surface survey of mounds only; no deep reconnaissance recommended; 3 = No surface survey recommended, deep reconnaissance recommended if deep impacts are anticipated; 3a = No surface survey recommended, deep reconnaissance recommended only if severe deep impacts are anticipated; 4 = no survey recommended.

sand dune deposits" (Fisher 1982). The proposed APE consists entirely of extensively disturbed, variably maintained highway ROW. Soils mapped along the alignment include beaches (map unit BBBX), Mustang fine sand (map unit Mn), and various complexes dominated by Veston loam (map units VesA, Vx, and Vs). Both Mustang soils, which are sandy and dominate the foreshore, and Veston soils, which are silty and dominate the more distal areas inland of the highway, are Entisols with weak, saline A-Cg profiles.

The proposed project is located within the Estuarine Zone subregion of the Gulf Coast Prairies and Marshes natural region defined by the Texas Parks and Wildlife Department (TPWD) (McMahan et al. 1984) and the "Marsh/Barrier Island" vegetative zone depicted on a map by Frye et al. (1984). This vegetation regime has been divided into three subtypes by McMahan et al. (1984), and the project location most closely conforms to the distribution

provided for Subtype 3: Smooth Cordgrass-Marsh Saltgrass-Sea Ox-eye (saline) Marsh, which is found on tidally inundated shores and bays of the Gulf Coast (McMahan et al. 1984:28). Plants commonly associated with this vegetative regime include black rush, vidrillos, black mangrove, glasswort, seashore paspalum, and shoalgrass. The existing highway ROW is primarily vegetated with various native and non-native grasses and forbs. Ground surface visibility within the project area ranges from 30 to 100 percent.

WA3

The survey associated with WA 3 was not performed due to lack of right-of-entry.

WA4 (CSJ: 1415-02-032)

This survey is situated along an approximately 1.05 km stretch of FM 1464 in the Upland Prairies and Woods subregion of the Gulf Coastal Prairies and Marshes natural region, as defined by TPWD. The area surveyed is located on a broad, relatively flat alluvial terrace of the Brazos River. The local topography exhibits a 0-1% slope with some artificial drainage cuts within the New Hope cemetery, at Oyster Creek on the southern terminus of the project, and on the flanks of the existing highway.

The entire APE is situated on a relatively flat terrace above Oyster Creek. It is mapped as Map Unit 1 ("Survey recommended, deep prospection recommended if deep impacts are anticipated") by the Houston-PALM (Abbott 2001; Figure 4). The underlying geologic unit is Holocene Alluvium (Qal) (Bureau of Economic Geology 1982). Soils mapped the APE include Brazoria Clay, 0 to 1 % slopes; Belk clay; and Norwood loam, 0 to 1 % slopes, rarely flooded. Of these, Belk soils make up 70% of the area, including all of New Home Cemetery, while Brazoria and Norwood soils make up about 15% each. Brazoria and Belk soils are Vertisols, while Norwood soils are classified as Inceptisols. According to the soil survey, the area is well drained with very low to moderately low permeability (Soil Survey Staff 2009). Land use in the APE and most of the surrounding vicinity consists of modified suburban development in the form of residential areas and landscaped areas with grass and trees. The notable exception is New Home Cemetery, which consists of filled areas with landscaping and exotic vegetation.

Prior to the archeological investigation, TxDOT cleared vegetation overgrowth within the portion of proposed ROW formally part of New Home Cemetery. Vegetation in that area consisted of ligustrum trees and amaryllis as well as grass and weeds. At the time of survey, the grass on the ground was between 1 inch and 3 inches in height. Within the cemetery, there were other intentional plantings of ligustrum and pecan trees as part of the cemetery landscaping as well as amaryllis and other exotic vegetation near graves. Ground surface visibility was estimated at 0-10%.

Figure 4: Detail of Houston PALM map showing FM 1464 (WA4) survey area and the location of New Home Cemetery. Key to map units: 1 = Surface survey recommended, deep reconnaissance recommended if deep impacts are anticipated; 2 = Surface survey recommended, no deep reconnaissance recommended; 2a = Surface survey of mounds only; no deep reconnaissance recommended; 3 = No surface survey recommended, deep reconnaissance recommended if deep impacts are anticipated; 3a = No surface survey recommended, deep reconnaissance recommended only if severe deep impacts are anticipated; 4 = no survey recommended.

PREVIOUS INVESTIGATIONS AND ARCHEOLOGICAL BACKGROUND

WA1 (3050-03-015)

Atkins reviewed the files at the Texas Archeological Research Laboratory and the Texas Historical Commission's Historic Sites Atlas prior to the survey. There was one recorded site, 41HR981, within 1 kilometer of the APE. Site 41HR981 is a prehistoric site located 750 ft north of the proposed detention pond on the south bank of Spring Creek. It was recorded in 2004 by Scott Sundermeyer. There were 42 artifacts found in the area, including lithic debitage and a small chert biface fragment. Site boundaries were not established during the survey, and available information was minimal.

In addition to this site, a small cemetery named the McCall Cemetery lies 770 m to the southeast of the project area. Since the cemetery is not located within the proposed project area and it will not be impacted by the proposed detention pond, it was not addressed.

WA2 (6192-34-001)

Review of the Texas Archeological Sites Atlas revealed a number of previous archeological investigations within 1.0 kilometer (0.621 mile) of the proposed project APE, all of which were negative for cultural material in the vicinity of the current project. These include:

- A negative Brazos Valley Research Associates survey conducted in 2008 for the U.S. Army Corps of Engineers, Galveston District, that included tracts immediately adjacent to the proposed project area and recorded no sites;
- An HRA Gray and Pape survey for TxDOT in 2005 that included part of the APE. This investigation consisted of a reconnaissance survey of segments of existing SH 87 and SH 124 rights of way. No archeological sites were recorded within the limits of the current project area during that investigation;
- A 2005 Coastal Environments survey of 22 outfall channels for TxDOT (Braud 2006). Surveyed tracts were located along a 28.5-mile-long segment of SH 87 ROW, including areas in the existing project area. This investigation did not identify any archeological sites within 1.0 kilometer of the proposed APE;
- A linear survey of a proposed water transmission line by Horizon Environmental Services, Inc., conducted for the Texas Water Development Board (TWDB) and the Lower Neches River Authority in 2003 (Brownlow and Iruegas 2004). The surveyed alignment paralleled SH 87 ROW. No archeological sites were recorded within the limits of the current project area during the Horizon investigation;
- A Texas Water Development Board (TWDB) survey for the High Island Independent School District in the Town of High Island in 1999 (Jurgens 1999) that identified one prehistoric campsite (41GV147) within the municipal limits of High Island. This site is located more than 1.0 kilometer (0.621 mile) outside of the current project area.

WA4 (1415-02-032)

The survey reported here is not the first survey conducted for the current project, and only encompasses part of the overall project APE. In 2005, TxDOT's Houston District contracted PBS&J to perform an intensive pedestrian survey of the project area as envisioned at that time, which extended north from SH99 (Grand Parkway) along FM 1464 to FM 1063, a distance of 7.2 miles, under Texas Antiquities Permit #3009. Pedestrian survey and shovel-testing did not encounter any prehistoric materials. PBS&J recommended that the APE is been extensively disturbed, no archeological historic properties would be affected, and no further archeological investigation is warranted and the undertaking should be allowed to proceed to construction. TxDOT agreed, and the State Historic Preservation Officer (SHPO) concurred with this recommendation on June l5, 2005.

In 2009, Fort Bend County determined that 20-ft of proposed ROW was needed from the New Home Cemetery at Orchard Lake Estates Drive. The use of this proposed ROW had been suggested by the County in the past, and TxDOT had strongly recommended against acquiring this property because of the potential for burials to exist. Despite this recommendation, Fort Bend County elected to acquire the property. TxDOT informed Fort Bend County that to remain in compliance with the Texas Health
and Safety Code, that portion of the cemetery would need to be de-dedicated, and the 20-ft of new ROW from New Home Cemetery would need to be investigated by a professional archeologjst to determine if unmarked burials were present.

Rather than contract with an archeologist, Fort Bend County and the land owner of this cemetery arranged for a non-profit group termed Project RESPECT to prospect for unmarked graves in the proposed ROW at New Home Cemetery. When this activity was reported, SHPO disagreed with the adequacy of effort and requested that TxDOT conduct "true, professional archeological investigations by archeologists that qualify under the Secretary of Interior Standard" (letter from the Texas Historical Commission to TxDOT dated November 17, 2009), and TxDOT ENV contracted with PBS&J to complete a survey under the current permit. This survey encompassed the newly acquired ROW between Stratford Drive and Oyster Creek, a distance of 3,225 ft.

The site form on record at TARL describes the cultural affiliation of the New Home Cemetery as both European and Mexican, with Protestant as the identifiable religious heritage. In contrast, an article in the Fort Bend Herald identified it as an African American cemetery (Adams 2006), an interpretation supported by subsequent work at the site (Hill & Pye 2012). The site form also mentions that some work has been done at the cemetery to clean it and identify all burials, and that the widening of FM 1464 caused the relocation of several graves. Additional research obtained from the Fort Bend County Historical Commission revealed that the New Home Baptist Church purchased this property from B.A. Evert in 1895

(Fort Bend County Deed Records, Vol.4, pp. 454-455), and that the State of Texas purchased a tract of this property from the church in 1950 to construct the road (Fort Bend County Deed Records, unknown volume, p. 267-268). In addition, this material contained an article from the Fort Bend Herald from 2006 that discussed the exhumation of 26 sets of remains at this cemetery during that year by a local funeral home (Adams 2006). Since the completion of PBS&J's (Atkins') work, Geo-Marine located, exhumed and analyzed an additional 24 unmarked burials dating from the late 19th through the mid-20th century (Hill and Pye 2012).

The New Home Missionary Baptist church is no longer standing at this site, and no additional information was found prior to the survey. In addition to the New Home Cemetery and church, review of the files at the Texas Archeological Research Laboratory and the Texas Historical Commission's Historic Sites Atlas revealed four sites recorded within 1 kilometer (km) of the APE: 41FB206, 41FB248, 41FB294, and 41FB295.

Site 41FB206 is a possible historic dump recorded my Moore Archeological Consulting. It is located 1 km east-southeast from the proposed undertaking on the north bank of Oyster Creek, between the creek to the south and Pumpkin Lakes to the north. The site boundary was established as 10 square meters, with artifactual material consisting of glass, ceramics, shell, and bone. The site was described as very disturbed and not eligible for listing in the NRHP.

Site 41FB248 is a Late Prehistoric/Neo-American lithic and ceramic scatter located west of the proposed undertaking. The site was recorded by Moore Archeological Consulting, who established its size as 880 m by 160 m. Artifactual material at the site consisted of stone tools, flaking debris, native ceramics, and bone. The site was described as having potential to be included in the NRHP and as an SAL.

Site 41FB294 was a historic/modem artifact scatter located 500 ft south of the proposed undertaking and on the north bank of Oyster Creek. It was recorded by Darren Latham (PBS&J) during the previous survey of FM 1464. The observed artifact assemblage consisted of 5 wire nails, 6 brick fragments, 3 metal fragments, 7 pieces of plastic, 2 pieces of clear glass, 3 pieces of historic ceramics, and 2 fragments of PVC pipe. Site boundaries were established as 15 m by 20 m, but were mentioned to possibly extend beyond the surveyed project area. The site was described as not eligible for listing in the NRHP.

Site 41FB295 was also recorded by Darren Latham (PBS&J) during the same survey. It consisted of a historic artifact scatter with the possible bases of two brick foundation piers, and is located 800 m south of the proposed undertaking and 250 m south of Oyster Creek along the east side of FM 1464. The site boundaries were established as 20 m by 60 m with

an artifact assemblage consisting of 9 wire nail fragments, 48 brick fragments, 65 metal fragments, 3 pieces of plastic, 50 shards of clear window glass, 15 sherds of historic ceramics, 2 plastic buttons, and asphalt roof fragments. The site was described as having unknown NRHP eligibility and as possibly extending beyond the boundaries of the surveyed area.

METHODS AND WORK CONDUCTED

WA1 (3050-03-015)

The proposed project area was situated in an upland setting in the Piney Woods, spanning terrain mapped as Map Unit 2 and Map Unit 4. The Houston Potential Archeological Liability Map (PALM) recommends a surface survey only for Map Unit 2 and no archeological survey warranted for Map Unit 4 (Abbott 2001). However, due to the proximity of 41HR981 and the scale of impacts involved in construction of a detention pond, the State recommended investigation of the entire 4.13-acre parcel.

The area was shovel tested with 1 shovel test placed in each corner of the rectangular tract (density of slightly less than 1 ST/ac). The area between the shovel tests was systematically examined through a pedestrian survey for evidence of prehistoric or historic cultural materials. The THC/CTA survey standards were not met because, in the surveyor's opinion, the limited subsurface potential in the APE, as previously indicated and confirmed in initial shovel tests, did not warrant the standards' shovel test density requirements.

WA2 (6192-34-001)

The proposed APE is located at the east end of Bolivar Peninsula, with the Gulf of Mexico to the immediate south and marshland and bays to the north and west. The availability of a wide variety of foodstuffs in the immediate vicinity of this location would have made it an attractive location for at least short-term habitation by indigenous peoples. The age of the mapped geological deposit corresponds with human occupation of the region, and Holocene-age deposits do have the potential to contain buried, intact archeological deposits.

According to the PALM, the majority of the proposed project area (about 91 percent of the proposed APE) is depicted as Map Unit 1 (Abbott 2001). A short segment of the proposed APE (approximately 750 feet [229 meters]) at the east end of the project area is depicted as Map Unit 3a (about 3 percent of the total APE). A segment of the project area in the approximate center of the APE is depicted as Map Unit 4. This area is roughly 3,000 feet (9.4 meters) in length, and borders the south edge of SH 87 in the approximate center of the proposed APE; it encompasses approximately 5 percent of the proposed APE. The PALM recommends surface survey in areas shown as Map Unit 1; deep reconnaissance (mechanical trenching) is recommended in these areas if deep impacts are anticipated (Abbott 2001:156). No surface survey is recommended in those areas depicted as Map Unit 3a, and deep reconnaissance is recommended in these areas only if severe deep impacts are anticipated. No survey is recommended in those areas depicted as Map Unit 4 (Abbott 2001:156).

Atkins archeologists visually examined the entire 4.7 mi (7.56 km) APE, focusing on those areas within the project limits and south of existing highway pavement. This investigation included walking at least 3.0 miles (4.8-kilometers) of the project length and careful visual

examination of the sides of low-lying, often-flooded areas within and immediately adjacent to the south half of the existing highway ROW. Existing conditions and evidence of previous disturbance were photo-documented. Areas of pedestaled, potentially intact sediment were examined for the presence of archeological deposits. This included visual examination of the tops and sidewalls of these areas within and just outside of the existing highway ROW. Pedestal sidewalls (or cutbanks) were faced in four separate locations throughout the project length to record existing sedimentary stratigraphy and better assess the degree of recent disturbance in those areas. One shovel test was excavated in a bench of sediment located between the highway pavement and an erosional cut to examine sediments that would have been directly impacted by previous highway construction. Examination of most of the investigated cutbanks extended down to the existing water table, and shovel test excavation was stopped when the water table was encountered. Sediment descriptions were completed for each of the faced cutbanks and for sediments encountered in the shovel test. Fill removed during shovel test excavation was screened through ¼-inch hardware mesh. The locations of the examined cutbanks and the shovel test were recorded with a hand-held GPS receiver and plotted on the corresponding portion of the USGS 1994 USGS High Island, Tex. [2994-422], 7.5' topographic quadrangle.

WA3

WA 3 was cancelled due to denial of right of entry. No work was performed.

WA4 (1415-02-032)

Due to the proximity of Oyster Creek, the area west of New Home Cemetery on the opposite side of the road was trenched and shovel tested. A total of 11 shovel tests spaced approximately 100 m apart were placed along the western side of FM 1469 between Stratford Creek Drive to Oyster Creek. The area between the shovel tests was systematically examined through a pedestrian survey for evidence of prehistoric or historic cultural materials.

The eastern side of the road, where New Home Cemetery is located, was examined with trenches. A series of approximately 21 trenches excavated with a backhoe with a 3-foot, smooth-bladed bucket, with the goal of demarcating the cemetery boundary and prospecting for burials. Backhoe trenches were placed on both sides of the road within 75 ft of the existing New Home Cemetery, and generally oriented parallel with the road surface. Placement was complicated by buried utilities and known graves. Trenches were placed in both the recently acquired ROW as well as within existing ROW adjacent to the cemetery, and were located at both the north and south ends of the cemetery as well as along the middle section. When materials were noted, they were photographed, protected with plastic and plywood, and reburied. No map of trench placement was made.

RESULTS

WA1 (3050-03-015)

The survey area for the detention pond consisted of a mosaic of open areas with medium-tall grasses and numerous areas wooded areas (Figure 5; Figure 6). The site area is situated near a fairly busy road (FM 2978) and is across from a strip mall. The north end of the project area is near Bogs Road, which is less busy than FM 2978, but still used frequently. The APE appears to not have been used for some time as evidenced by the lack of recent soil disturbances and vegetation overgrowth. The lack of a surface soil layer overlying the sandy clay loam subsoil may indicate that the area has suffered significant degradation so that the surface soils have eroded away.

The proposed detention pond area was shovel tested in four locations. The shovel tests were placed near the corner of the proposed project area and the area between the shovel tests was pedestrian surveyed for prehistoric or historic cultural materials. Shovel tests exhibited a relatively uniform stratigraphic profile of yellowish brown (2.5YR 4/6) sandy clay loam representing a soil B horizon. The lack of surface soils overlying the sandy clay loam subsoil may indicate that the area has been affected by sheet erosion. All four shovel tests were culturally sterile, and no prehistoric nor historic evidence was found during this cultural resource survey of the APE.

Figure 5: Typical view of FM 2978 Detention Pond Project Area, facing northeast

Figure 6: Typical view of FM 2978 Detention Pond Project Area, facing southwest.

WA2 (6192-34-001)

The field investigation indicated that the south side of the existing State Highway 87 ROW within the proposed project limits has been extensively disturbed by wave-derived erosion associated with normal tidal fluctuations and previous tropical storms (Figures 7-9), the most recent of which was Hurricane Ike. These processes have cut channels through and depressions into areas of intact, elevated sediments; scoured area sediments; mixed beach deposits with existing soil horizons; and deposited layers of beach sediments on existing soils within the project area. Such processes have reworked area sediments along the coastal edge of Bolivar Peninsula since the sea level stabilized at its current elevation about 4,000 B.P. (Waters 1992:254).

The proposed APE has been further disturbed by earth-moving activities associated with preparation of the existing highway ROW for highway construction, construction of SH 87, the excavation of drainage ditches, the installation of drainage facilities, and repetitive maintenance activities. The south edge of the existing highway ROW has been further impacted by beach stabilization and maintenance activities. The beach side of the existing SH 87 ROW within the project limits also has been impacted by previous ROW boundary marker and fence installation, and subsurface and surface utilities installation (though to a lesser degree than on the north side of the highway). Existing highway ROW has been

Figure 7: View along SH87 beachfront.

Figure 8: Illustration of backbeach scour adjacent to US87 roadway.

Figure 9: Exposed, safety-end-treated concrete culvert illustrating erosion in the US87 ROW.

further disturbed by heavy equipment used in cleanup activities following tropical storms and hurricanes.

While various factors suggest that the APE is located in an environment that was attractive to human settlement and potentially conducive to the preservation of archeological deposits, it is also true that the APE is located on the edge of an active marine environment. As such, the project area is subject to tidal and storm-driven erosional processes and sediment mixing. These processes have been active in this location since sea level attained its present level about 6,000 B.P. and stabilized in its present position about 4,000 B.P. (Waters 1992:254). The effects of such natural processes were clearly evident within the proposed APE during the field investigation, and these processes certainly would not be amenable to the preservation of archeological deposits, much less intact archeological deposits. The APE also has been extensively disturbed by various recent and modern human activities, chiefly the construction of SH 87 and repetitive efforts to maintain the highway and existing barrier island and beach deposits immediately south of the highway. Thus, while resource availability might have been attractive to previous human settlement, and the age of the mapped geological unit indicates that evidence of such occupation could be preserved beneath the modern surface, characteristics of the natural environment and extensive recent human activity within the proposed project area strongly suggest that any

archeological deposits that might have been located within the APE would have been disturbed if not destroyed.

No archeological materials or settings with reasonable potential to contain archeological historic properties (36 CFR 800.16.(l)) or State Archeological Landmarks (13 TAC 26.12) were identified within investigated portions of the proposed APE during the recent Atkins field investigation. No new archeological sites were identified during the Atkins field investigation.

WA3

WA 3 was cancelled due to denial of right of entry. No survey was performed.

WA4 (1415-02-032)

The west side of FM 1464 was examined with 11 shovel tests and 13 backhoe trenches between Oyster Creek and Stratford Creek Drive; the area between the shovel tests was subjected to a pedestrian surface inspection for prehistoric or historic cultural materials. Shovel tests exhibited fill layers anywhere from 0 to 50 centimeters below the surface (cmbs) mixed with the clay loam and clayey soils found in the remaining soil layers. Clayey soils were encountered mixed with road fill and other modem materials from the excavation of the ditch and buried utilities. The presence of fill demonstrates that the project area on the west side of FM 1464 has undergone moderate to significant disturbances caused by the road construction and maintenance, buried utility installation, and construction of a drainage ditch. None of the 11 excavated shovel tests and 13 backhoe trenches on the west side of FM 1464 yielded evidence of prehistoric or historic artifacts or features.

The proposed project area on the east side of FM 1464 and adjacent to New Home Cemetery was subjected to mechanical scraping (4-inch layers with a smooth-bladed bucket) to identify any unmarked graves that may exist. Three trenches excavated north of the cemetery exhibited very wet clayey soils and no evidence of burial shafts, human remains, or coffin hardware. Two of these trenches collapsed at approximately 5 ft in depth before reaching the target depth of 7 ft. One other trench in the middle of the APE adjacent to the cemetery (south of the existing driveway) did not exhibit any evidence of burial shafts, human remains, or coffin hardware, and also collapsed at approximately 5 ft in depth before reaching the target depth of 7 ft.

Three other trenches excavated along the APE adjacent to the cemetery and the one trench excavated within the existing ROW adjacent to the cemetery did contain materials associated with the cemetery, including burial shafts containing disturbed human remains and funerary materials (Figures 10-13). All three of the trenches along the APE adjacent to

Figure 10: View of backhoe initiating scraping in existing ROW in front of New Home Cemetery.

the cemetery showed evidence of burial shafts, miscellaneous unarticulated human remains (partial fibula, vertebrae, etc.), miscellaneous coffin hardware, grave- tending goods, personal effects, and, in one trench, two complete, empty metal coffins. Atkins' scraping in the cemetery proper resulted in several observations:

- identifiable grave shafts often contained disturbed human remains, personal effects, and/or coffin hardware, almost certainly the result of previous relocation efforts.
- The shaft fill primarily consisted of loose, dark brown clay, while the surrounding subsoil was firmer, denser, and lighter brown in color. All sediments were very moist to wet.
- The coffins, human remains, coffin hardware, and personal effects were located at depths between 2.5 and 3.5 ft below current ground surface.

Figure 11: Example of grave shaft noted during survey.

Figure 12: Metal coffin exposed by scraping.

Figure 13: Backfilling of scrape. Note standing water in trench.

- Both disturbed burials (including empty coffins) and apparent intact burials were likely present. No archeological materials were collected, but the trenches, human remains, coffin hardware, coffins, and burial shafts were photographed, sketched in plan view, and the burial shafts were mapped with a Trimble GPS unit. All cultural material was covered with plastic sheeting and plywood before the trenches were refilled; the trenches were not excavated below this level to determine whether stacked burials may exist.

In addition to these disturbed shafts in the proposed ROW, one trench placed outside the concrete curbing in the existing ROW encountered an intact, articulated burial 3 to 3.5 ft below surface. The soil in this trench was black clay, and no burial shaft was observed, so the burial was damaged by the scraping, and the maxilla shattered. Subsequent hand probes revealed that the burial was surrounded by intact coffin hardware, but no evidence of

coffin wood was found over the burial or within the backdirt. Extremely faint lines noted in the trench floor to the south and possibly to the north suggested that additional burials might be present in the area. This burial was covered in muslin and plastic, overlain with plywood, and an exact Trimble coordinate point for the burial was taken. The area was then backfilled. A sketch map of the area was begun, but a severe rain event prevented archeologists from photographing the trench, drawing a detailed plan view before the trench started to flood. The remains were in extremely poor condition, and the water was considered likely cause additional damage.

In summary, the proposed project area is situated near a fairly busy road (FM 1464) in an area of new urban development. The northernmost portion of the project closest to Stratford Creek Drive as well as the western side of FM 1464 appear to have undergone significant disturbances during the construction of the road and buried utilities in the area as well as the drainage ditch on the west side. The remaining area on the east side of the road and adjacent to the cemetery contains a drainage culvert in one area, but the ground is fairly level between the currently marked cemetery and the existing road. There may be some disturbance associated with drainage improvement, and there is some level of disturbance associated with the previously exhumed remains found within the excavated trenches. However, much of the area remains undisturbed on the east side, and the presence of an articulated, previously undisturbed burial demonstrates there is a high potential for additional burials to exist within the existing ROW and the proposed APE. In addition, these trenches were not excavated below about 3.5 ft where the burial features were located, and intact burials could be present underneath them. Documentation of the survey area was suspended because of weather, and never resumed because the contractual dispute alluded to earlier developed between Atkins and TxDOT. While the investigation of the eastern side of the road adjacent to New Home Cemetery was ultimately completed by Geo-Marine, Inc. (Hill & Pye 2012), the Atkins survey was used to clear the western side of FM 1464.

CONCLUSIONS AND RECOMMENDATIONS

WA1 (3050-03-015)

In accordance with 36 CFR 800.4, Atkins made a reasonable and good faith effort to identify archeological historic properties within the APE of the planned detention pond associated with FM 2978. No archeological sites were previously recorded at this location and none were identified during the present survey. Pedestrian survey and shovel testing conducted within the project area and found the APE to be culturally sterile. Accordingly, Atkins documented no archeological Historic Properties (36 CFR 800.16.(1)) or SALs (13 TAC 26.12) within the project area. As no properties were identified that meet the criteria for listing in the NRHP according to 36 CFR 60.4 or for designation as a State Archeological Landmark according to 13 TAC 26.12, Atkins recommended no further investigation for the APE associated with the proposed detention pond along FM 2978 in its interim survey report. TxDOT concurred with this recommendation, and, consistent with the procedures outlined by the First Amended Programmatic Agreement Among the Federal Highway Administration, the Texas Department of Transportation, the Texas State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the Implementation of Transportation Undertakings (PATU), and the Memorandum of Understanding Between the Texas Historical Commission and the Texas Department of Transportation(MOU), determined that the project does not merit further work on May 18, 2011.

WA2 (6192-34-001)

In accordance with 36 CFR 800.4, Atkins made a reasonable and good faith effort to identify archeological historic properties within the APE of improvements to US 87 on the Boliver Peninsula. The field investigation indicated that the majority of the proposed APE within the project limits has been extensively disturbed by beach erosion and redeposition, and various human activities associated with previous highway construction, repetitive highway and ROW maintenance, landform stabilization, utilities installation, and post-storm cleanup activities. Pedestaled soil remnants do exist within and along the south edge of the existing ROW, and inspection of several cutbanks along the project length did reveal evidence of a possible soil horizon capped by beach deposits in at least three of the inspected banks (1, 3, and 4). While the pedestaled areas of intact sediment would have the greatest potential for the presence of intact archeological deposits, it should be noted that most of these areas are located outside of the existing highway ROW. Several areas of elevated sediment are located within the existing ROW in the northern portion of the proposed APE. However, some of the pedestaled areas within the ROW have been extensively disturbed by previous ditch excavation, and the sides and tops of all of those areas exhibit evidence of extensive mechanical disturbance and redeposition within the upper portions of the soil profiles. Based on these observations, the fact that most of the pedestaled areas are located just outside of the existing ROW strongly suggests that such sediments were cut back from the

edges of the ROW in order to exposed underlying clays prior to the start of highway road construction. Subsequent erosion would have cut some of these areas even further from the south edge of the existing highway ROW.

Although the PALM indicates that Mustang series soils have a high potential for the presence of prehistoric archeological deposits (Abbott 2001: Table 2), many of the previously noted disturbances either removed area sediments completely or extended well below original surface levels. The various and extensive forms of previous disturbance observed throughout the project area likely would have compromised the integrity of location, materials, and association of any archeological deposits that might have been located within the proposed APE. No archeological materials or deposits were identified during the Atkins field investigation or during previous field investigations that included all or part of the currently proposed APE within earlier investigation areas.

Accordingly, Atkins proposed a finding that the APE does not contain archeological historic properties (36 CFR 800.16(l)), and the proposed undertaking would not affect archeological historic properties (pursuant to Stipulation VI of the First Amended Programmatic Agreement among the Federal Highway Administration, the Texas Department of Transportation, the Texas State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the Implementation of Transportation Undertakings [PA-TU]). In addition, the project does not merit intensive survey or additional field investigations in compliance with the Memorandum of Understanding (MOU; 43 TAC 2.24(f)(1)(C)) between TxDOT and the Texas Historical Commission (THC).

WA3

WA 3 was cancelled due to denial of right of entry.

WA4 (1415-02-032)

The pedestrian survey augmented with shovel testing on the west side of FM 1464 found the APE to be culturally sterile. No prehistoric or historic artifacts or evidence of human burials were found on this side of the project area. The lack of cultural material and archeological sites within the project area supports the investigator's recommendation of cultural resources clearance on the west side of the APE. No archeological Historic Properties (36 CFR 800.16(1)) or SALs (13 TAC 26.12) are present within the APE on the west side of FM 1464.

However, on the east side of the project area, one intact human burial was found. Additionally, the remains of previous partial exhumations are evident in the presence of human remains, coffin hardware, personal effects, empty coffins, and burial shafts. In addition to the one intact human burial, other areas are highly suspected for additional burials.This discovery triggered the Texas Health and Safety Code, which gives the Texas

Historical Commission (THC) authority to enforce and administer rules relating to unknown or abandoned cemeteries, burial removal, and the removal of a cemetery's dedication. This work was subsequently completed by Geo-Marine, Inc., under Texas Antiquities Permit 5804 and consistent with provisions of the Texas Health and Safety Code in force at that time (Sections 711.004, subsection f, and 711.010).

In accordance with 36 CFR 800.4, PBS&J (Atkins) made a reasonable and good faith effort to identify archeological historic properties within the APE. No archeological sites were previously recorded at this location, and none were identified during the present survey. On the basis of this work, TxDOT found that a) the inventory for unmarked burials and archeological materials on the west side of FM 1464 was complete and no significant archeological historic properties or unmarked burials were encountered; b) that the remaining inventory for unmarked burials on the east side of FM 1464 is incomplete; and c) construction on the west side of FM 1464 should be allowed to proceed to move traffic away from the New Home Cemetery and facilitate the exhumation of human remains on the east side of FM 1464. The SHPO concurred with these recommendations on May 18, 2010.

References

Abbott, J.T. 2001. *Houston Area Geoarcheology: A Framework for Archeological Investigation, Interpretation, and Cultural Resource Management in the Houston Highway District*. Report 27. Archeological Studies Program, Environmental Affairs Division, Texas Department of Transportation, Austin.

Adams, Denise, 2006. *New Home Cemetery being restored by group.* Fort Bend Herald, Sunday, July 16.

Braud, M.R. 2006. *Archeological Survey of Proposed Outfall Channel Improvements Along State Highway (SH) 87, Bolivar Peninsula, Galveston, Texas*. Report No. 86. Archeological Studies Program, Environmental Affairs Division, Texas Department of Transportation, Austin.

Brownlow, R., and S. Iruegas, 2004. *An Intensive Cultural Resources Survey of a Proposed Water Transmission Line from High Island to Singing Sands, Galveston County, Texas*. Horizon Environmental Services, Inc., Austin.

Bureau of Economic Geology, 1968. *Geologic Atlas of Texas, Beaumont Sheet.* Bureau of Economic Geology, University of Texas at Austin.

Bureau of Economic Geology, 1982. *Geologic Atlas of Texas, Houston Sheet.* Bureau of Economic Geology, University of Texas at Austin.

Frye, R.G., K.L. Brown, and C.A. McMahan, 1984. *The Vegetation Types of Texas*. Texas Parks and Wildlife Department.

Hill, M. C., and J. W. Pye, 2012. *New Home Cemetery (41FB334): Archaeological Search, Exhumation, and Reinterment of Multiple Historic Graves Along FM 1464, Sugar Land, Fort Bend County, Texas (CSJ 1415-02-032)*. Report 145. Archeological Studies Program, Environmental Affairs Division, Texas Department of Transportation, Austin, and Geo-Marine Miscellaneous Reports of Investigations 545.

Jurgens, C.J., 1999. *An Archeological Survey of Proposed Wastewater Facility Improvements. High Island Independent School District, Galveston County, Texas*. Texas Water Development Board, Austin.

McMahan, C.A., R.G. Frye, and K.L. Brown, 1984. *The Vegetation Types of Texas, including Cropland*. Map and Accompanying Illustrated Synopsis. Wildlife Division, Texas Parks and Wildlife Department, Austin, Texas.

Texas Parks and Wildlife Department GIS Laboratory, 1978. Natural Subregions of Texas. Compiled from *Preserving Texas' Natural Heritage*. LBJ School of Public Affairs Policy Research Report 31, 1978. The University of Texas at Austin.

U.S. Department of Agriculture, Natural Resources Conservation Service (USDA-NRCS), 2009. Soil Series Classification Database. http://soils.usda.gov/technical/classification/ Accessed February 4, 2009.

United States Department of Agriculture, Soil Extension Service (USDA-SCS),1988. *Soil Survey of Galveston County, Texas*. U.S. Department of Agriculture, Soil Conservation Service, in cooperation with Texas Agricultural Experiment Station.

Waters, M.R.,1992. *Principles of Geoarchaeology: A North American Perspective*. The University of Arizona Press, Tucson.

Appendix 1

Interim Survey Reports

(See disk)

Appendix 2

Project Shapefiles

(see disk)